Making the social sciences **matter** for energy policy: epistemic shifts and methodological advances

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What I will cover

• Who am I and what is my angle?
• The problems of energy social sciences for policy

• Problem 1: interdisciplinarity
• Solution 1: integrated socio-technical research

• Problem 2: transdisciplinarity
• Solution 2: energy policy epistemology
Policy Impact, EBPM and Science Advice

- Fair bit written about how to have impact
- Most advice treats `symptoms` not causes
  - Language
  - Timing
  - Networks
  - Access
- But then there is the `real` problem...

The **real** problem...

- Academic ESSR is **largely irrelevant** in UK policy making

- Where it is relevant, it is **largely incomplete**:
  - ‘Problematizing’ without ‘solutionising’
  - Wrong scale or time
  - Wrong intervention or population
  - Backward- not forward-looking
  - Ignores **policy pragmatics**
    - Ignores **policy context**
    - Wrong kind of data
Wrong kind of data

• Energy is a socio-technical system
• Energy research is technical and/or social
• Policy needs integrated socio-technical data
• Where are the methods for collecting integrated socio-technical data?

• Problem 1: The problem of interdisciplinarity


Ignoring the policy context

• Assumption that ‘good’ research is same in policy and academia
• Failure to take account of the particular knowledge demands generated by policy context
• Epistemic conflict between academia and policy

• Problem 1: The problem of interdisciplinarity

• Problem 2: The problem of transdisciplinarity
The problems of ESSP

• Problem 1: The problem of interdisciplinarity

• Problem 2: The problem of transdisciplinarity
The interdisciplinary problem

- Case study: thermal comfort

- How is data currently collected
  - Technical
  - Social and technical

- Particular issues with this approach

- An example solution: contextual thermography

- General lessons
Technical data capture: Co-heating test

Source: Samuel Stamp, LoLo EPSRC CDT: http://www.lolo.ac.uk/w2up3/
Source: Oswald Consultancy: https://oswaldconsultancy.wordpress.com/2012/07/13/coheating-taming-the-test/
Technical data capture: Thermal Imaging

Fig. 6- (a) Thermograph showing thermal anomalies (thermal bridging), in purple cold steel studs temperature reading sp3 15.8 C (b) investigated wall, internally looking at a classroom

‘Social’ and technical data capture: Thermal comfort

Strips out spatial dynamics, context and meaning
Living Room with three friends chatting on a Saturday afternoon becomes:

“Generally feels quite warm”

OR

-3 -2 -1 0 +1 [+2] +3

Multiple challenges to validity with self report

Technical data capture misses these effects:

Social exclusion makes you cold


AND

Being warm leads to prosocial/trusting behaviour

A new method to address this: contextual thermography

An interdisciplinary socio-technical research method to:

• Capture physical parameters on a human, social scale
• Enable interpretation of context and behaviour

All within the same frame of reference.

Combines video ethnography and thermal imaging
## Differences vs video ethnography and thermography

<table>
<thead>
<tr>
<th>Video ethnography</th>
<th>Thermography</th>
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<tbody>
<tr>
<td>Capturing thermal spectrum data alongside video data</td>
<td>Multiple frame capture (video)</td>
</tr>
<tr>
<td>Analysis includes quant estimation of ‘thermal landscape’, estimations of clo etc</td>
<td>Capturing whole rooms, with people</td>
</tr>
<tr>
<td></td>
<td>Analysis includes interpreting arrangements and activities</td>
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</table>
Demonstrating contextual thermography in UCL’s climate chamber
Relative temperatures to infer comfort

Radiative Heat (°C)

Context

Face

Body

Comfortable?

Uncomfortable?
Socio-technical analysis with contextual thermography: an example

With friends

Sitting alone

Temperature (°C)

Time (mins)
Emerging advantages of contextual thermography

- Observational assessment of thermal comfort
- Use of relative vs absolute temperature values
- Capture of dynamics of temperature and activity over time and space
- Capture of dynamics of social settings over time
- Automatic capture of a range of data which can be deployed at scale
- Ability to anonymously identify individuals to track over time (longitudinal)
Issues and limitations

Currently very little testing and pilot data: initial tests are promising

IR Cameras are not optimized for this use:
- Depth of field too shallow
- Field of view too narrow

Need to develop new algorithms to classify ‘thermal landscapes’

For large N deployment need auto recognition of individuals
The problems of ESSP

- Problem 1: The problem of interdisciplinarity
- Problem 2: The problem of transdisciplinarity
The Transdisciplinarity problem

- Issue of how academic research and policy interact
- Visible in logics of research quality and impact

Logic:
- **Problem**: evaluation not guiding policy effectively
- **Assumption**: RCTs = best to understand causality
- **Solution**: more evaluation should be RCT-like


Should evaluation use more RCT-style designs?

• Presupposes single epistemic perspective

• What if policy making has a different epistemic perspective?

• An ‘energy policy epistemology’ might justify a focus on other research designs as ‘best’
An ‘energy policy epistemology’

What drives a preference for other approaches?
This doesn’t rule out RCTs, but drops them down the merit order.

What might drive preferences away from RCTs?
This would rule them out as a design choice.

An ‘energy policy epistemology’

What drives a preference for other approaches?

- **Accountability** – we’ve done what we said we’d do
- **Representation** – we understand how this affects the electorate
- **Useful subjectivity** – actors in the policy have agency and can detect issues

**Contextual factor**: limited resources (money, time and people) targets most efficient way of achieving each
An ‘energy policy epistemology’ II

What drives preference away from RCTs?

• **Limited agency** – FMDs not expected to control everything; this leads to:
• **Negotiated certainty** – policy causality may arise through *agreements* between actors

Combination counts **against** RCTs where:
• experimenter must have **total agency**; and
• causality is not negotiated but **discovered**
An ‘energy policy epistemology’ III

Other factors important for impact

Research/data should have:

- **Timeliness** (cf. Kingdon’s ‘window of opportunity’)
- Capture **wider impacts** (co-benefits)
- Maximised **internal validity** inside EPE
# Designs for the EPE

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<tr>
<th><strong>EPE feature</strong></th>
<th><strong>Ideal design approach</strong></th>
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<tr>
<td>Accountability</td>
<td>Systematic quantitative data collection capturing policy delivery</td>
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<tr>
<td>Representation</td>
<td>Large enough N to derive valid population sub-group generalization</td>
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<tr>
<td>Useful subjectivity</td>
<td>Supports qualitative inquiry integrated into research</td>
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<tr>
<td>Limited agency &amp; Negotiated certainty</td>
<td>Is mainly observational in approach, or design not undermined by changing policy</td>
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**Timeliness**
- Data collection is ongoing

**Wider benefits**
- Data collection captures, or can be linked to other sources of data on different topics

**Internal validity**
- Approach takes advantage of natural variation in deliver (e.g. natural experiments)
LUKES: Longitudinal UK Energy Survey

Building block 1: Smart Meter Research Portal
https://www.ucl.ac.uk/bartlett/energy/smart-meter-research-portal-smrp

See: http://www.ucl.ac.uk/steapp/research/projects/energy-lab
Thanks for listening!

Fire away with questions, comments, critiques or general exclamations of awe...

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